NORTH CAROLINA DIVISION OF AIR QUALITY

Application Review

Issue Date: TBD

Region: Winston-Salem Regional Office

County: Rockingham NC Facility ID: 7900156

Inspector's Name: Robert Barker **Date of Last Inspection:** 12/04/2019

Compliance Code: 3 / Compliance - inspection

Facility Data

Applicant (Facility's Name): Duke Energy Carolinas, LLC-Rockingham Co

Comb. Turb.

Facility Address:

Duke Energy Carolinas, LLC-Rockingham Co Comb. Turb.

240 Ernest Drive

Reidsville, NC 27320

SIC: 4911 / Electric Services

NAICS: 221112 / Fossil Fuel Electric Power Generation

Facility Classification: Before: Title V After: Title V Fee Classification: Before: Title V After: Title V

Permit Applicability (this application only)

SIP: 02D: .0501, .0516, .0521, .0524, .0530,

.1111, .1806 02Q: .0317, .0400, .0512

NSPS: GG, IIII NESHAP: ZZZZ

PSD: NOx, SO₂, CO, VOC, PM, H₂SO₄

PSD Avoidance: n/a

NC Toxics: Avoidance of 02D .1100

112(r): n/a

Other: 40 CFR Part 97, Subparts 5A, 5B, 5C

Contact Data			Application Data
Facility Contact	Authorized Contact	Technical Contact	Application Number: 7900156.20A and 20B Date Received: 01/06/20 (.20A); 01/25/20 (.20B)
Dana Newcomb Lead EHS Professional (336) 635-3186 240 Ernest Drive	Michael Lanning General Manager (336) 635-3080 864 South Edgewood	Erin Wallace Sr. Environmental Specialist (919) 546-5797	Application Type: Renewal (TIV and TV) Application Schedule: TV-Renewal Existing Permit Data
Reidsville, NC 27320	Road Eden, NC 27288	410 South Wilmington Street Raleigh, NC 27601	Existing Permit Number: 08731/T15 Existing Permit Issue Date: 03/18/2016 Existing Permit Expiration Date: 10/31/2020

Total Actual emis	sions in	TONS/	YEAR:
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CY	SO2	NOX	voc	СО	PM10	Total HAP	Largest HAP
2018	8.03	592.17	26.10	371.83	42.64	13.10	8.85 [Formaldehyde]
2017	2.32	166.66	7.69	109.57	11.90	3.79	2.59 [Formaldehyde]
2016	4.02	307.25	14.43	205.66	22.09	7.09	4.86 [Formaldehyde]
2015	4.32	203.74	8.84	125.39	16.35	4.61	3.02 [Formaldehyde]
2014	1.62	67.14	2.79	39.28	5.22	1.41	0.9443 [Formaldehyde]

Review Engineer: Russell Braswell Comments / Recommendations:

Review Engineer's Signature: Date: Issue 08731/T16

Permit Issue Date: TBD

Permit Expiration Date: TBD+5 years

1. Purpose of Application:

Duke Energy Carolinas, LLC-Rockingham Co Comb. Turb. ("Duke-Rockingham", "the facility") currently operates a power plant in Rockingham County under Title V Air Quality Permit 08731T15 ("the existing permit"). The Title V permit also incorporates the Phase II Acid Rain Permit (a.k.a. "Title IV permit"). Both of these permits are set to expire on October 31, 2020. Duke-Rockingham submitted applications .20A and .20B to renew both of these permits as required by General Condition K of the existing permit. The renewal applications did not request any specific modifications to the permits.

Because the applications for permit renewal were received at least six months¹ before the expiration date, the existing permits will remain in effect, regardless of expiration date, until these permit applications are approved or denied.

2. Facility Description:

Duke-Rockingham is a power plant consisting of five simple-cycle gas turbines and various supporting activities. The turbines are fired with natural gas and/or No. 2 fuel oil. According to the most recent inspection report, the facility is designed to generate electricity during peak demand, but can theoretically run 24 hours per day.

3. Application Chronology:

•	January 6, 2020	Application .20A	Title IV renewal)	received in central office.
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- January 28, 2020 Application .20B (Title V renewal) received in central office.
- March 13, 2020
 An initial draft of the renewed permit and associated application review were sent to DAQ staff (Mark Cuilla, Tom Anderson, Samir Parekh, Robert Barker, Lisa Edwards) and Duke-Rockingham staff (Dana Newcomb, Erin Wallace).

 For a summary of comments received on these initial drafts, see Attachment 1.
- April 7, 2020 In an email, Erin Wallace confirmed that the mailing address for this facility is the same as Duke's facility in Dan River.
- XXX Public notice.
- XXX Permit issued.

4. Title V Permit Modifications Following the Previous Permit Renewal:

- November 16, 2015 Permit T14 issued. This was a Title V permit renewal. In addition, references to the Clean Air Interstate Rules were removed and a reference to the Cross State Air Pollution Rule was added.
- March 18, 2016 Permit T15 issued. This was a PSD-Major Modification that allowed for alternative NOx limits during cold weather when firing natural gas.

¹ General Condition K of the existing permit requires that the renewal applications be submitted nine months before the expiration. General Condition K was changed to six months after the existing permit was issued. These applications were received before the nine-month deadline as well.

5. Changes to the Title V Permit:

The following changes were made to the Duke Energy Carolinas LLC Rockingham County Combustion Turbine Facility Air Permit No. 08731T15:

Page*	Section*	Description of Changes	
Throughout	Throughout	 Updated dates/permit numbers. Fixed formatting. Updated name of Responsible Official. 	
16	2.1 C.3.b	Added noncompliance statement to this paragraph.	
18	2.1 D.3.b	Added noncompliance statement to this paragraph.	
24	2.2 B.1	Indicated that Permittee has demonstrated initial compliance with MACT Subpart ZZZZ.	
28	2.5	• Removed references to 02D .2400 because this rule has expired and no longer contains any text.	
28	3.	Updated General Conditions to v5.3.	

^{*} This refers to the current permit unless otherwise stated.

6. Regulatory Overview and Rules Review:

Under the existing permit, Duke-Rockingham is subject to the following State Implementation Plan ("SIP") rules:

- 15A NCAC 02D .0501 "Compliance with Emission Control Standards"
- 15A NCAC 02D .0516 "Sulfur Dioxide from Combustion Sources"
- 15A NCAC 02D .0521 "Control of Visible Emissions"
- 15A NCAC 02D .0524 "New Source Performance Standards" (40 CFR Part 60, Subparts GG and IIII)
- 15A NCAC 02D .0530 "Prevention of Significant Deterioration"
- 15A NCAC 02D .1111 "Maximum Achievable Control Technology" (40 CFR Part 63, Subpart ZZZZ)
- 15A NCAC 02D .1806 "Control and Prohibition of Odorous Emissions" (State enforceable only)
- 15A NCAC 02Q .0317 "Avoidance Conditions" (Avoidance of 02D .1100; State enforceable only)
- 15A NCAC 02Q .0400 "Acid Rain Procedures"
- 15A NCAC 02Q .0512 "Permit Shield and Application Shield"

In addition to the above SIP rules, Duke-Rockingham is also subject to the Cross State Air Pollution Rule ("CSAPR"), which is not directly referenced in North Carolina's SIP.

Duke-Rockingham's requirements under each rule that applies to this facility are discussed below. In addition, rules that do not apply to this facility are also discussed below. Duke-Rockingham's applicability to various Federal programs (e.g. NSPS, MACT, PSD, 112(r), and CAM) is also discussed below.

a. 02D .0501 "Compliance with Emission Control Standards"

This rule generally requires that facilities not cause or contribute to an exceedance of the ambient standards ("NAAQS") in 02D .0400. Per 02D .0501(c), this rule is included as a specific condition in the

permit when controls more stringent than the others listed in Section 02D .0500 are deemed necessary to ensure compliance with the NAAQS.

This rule was initially included in the permit with the T11 revision (issued October 1, 2010) when the emergency generator ES-EGEN-BS was added to the permit. In the application review for the T11 revision, it was determined that there would be no NAAQS exceedance provided that ES-EGEN-BS only be operated 1) during black-start conditions with a single turbine, or 2) during generator maintenance and readiness testing when only four or fewer turbines are operating.

In order to demonstrate compliance with this rule, Duke-Rockingham must keep records of generator operation that show the generator is being operated only when appropriate. A summary of the records must be reported twice per year.

Based on the most recent inspection, Duke-Rockingham appears to be in compliance with this rule. Continued compliance will be determined with subsequent inspections and reports.

b. 02D .0516 "Sulfur Dioxide from Combustion Sources"

This rule limits sulfur dioxide (" SO_2 ") emissions from combustion sources for which there are no other SO_2 emission standards. In all cases, the limit is 2.3 pounds of SO_2 per million Btu of heat input.

Each of the emergency generators are subject to this rule. None of the turbines are subject to this rule because they are subject to SO_2 emission standards under 02D .0524 and .0530.

The generators at this facility only burn No. 2 fuel oil or natural gas. Based on the emission factors found in chapters 3.2 and 3.4 of USEPA's document "Compilation of Air Emissions Factors" (a.k.a "AP-42"), these fuels are expected to comply with 02D .0516 by default. Therefore, no monitoring, recordkeeping, or reporting is required for Duke-Rockingham to demonstrate compliance with this rule. Continued compliance is expected.

c. 02D .0521 "Control of Visible Emissions"

This rule limits the opacity of non-fugitive visible emissions ("VE") from emission sources that do not have a specific VE limit under other 02D .0500 rules. At this facility, each turbine and generator are is subject to this rule. For sources constructed after 1971 (i.e. each source at this facility), the rule limits opacity in most cases to 20%.

In general, emergency-use generators are not expected to produce VE under normal operations. Therefore, the permit does not require any specific monitoring, recordkeeping, or reporting for VE from the generators.

In general, burning natural gas in a combustion turbine is not expected to produce VE in excess of 20% under normal operations. To address the possibility of VE from the turbines while burning fuel oil, Duke-Rockingham is required to perform a Method 9 test for VE after operating for 1,100 hours on fuel oil. An additional test is required for each subsequent 1,100 hours of operation. Duke-Rockingham is required to keep records of VE tests and report them twice per year.

Based on the most recent inspection, Duke-Rockingham appears to be in compliance with this rule. Continued compliance will be determined with subsequent inspections and reports.

d. 02D .0524 "New Source Performance Standards" ("NSPS"; 40 CFR Part 60)

This rule incorporates the NSPS rules into North Carolina's SIP. The only NSPS rules that apply to this facility are Subparts GG and IIII.

1. Subpart GG "Stationary Gas Turbines"

This rule applies to stationary gas turbines constructed after October 3, 1977. Each turbine at this facility is subject to this rule.

In general, the rule requires that turbines comply with emission standards for nitrogen oxides ("NOx") and SO_2 .

In order to demonstrate compliance with the NOx limit, Duke-Rockingham operates a continuous emission monitoring system ("CEMS").

In order to demonstrate compliance with the SO_2 limit, Duke-Rockingham follows an approved fuel monitoring plan that monitors the amount of sulfur in the fuel. The fuel monitoring plan was approved on August 17, 2000.

Duke-Rockingham must keep records of CEMS operation and fuel monitoring. Reports of the recordkeeping activities must be submitted twice per year.

Based on the most recent inspection, Duke-Rockingham appears to be in compliance with this rule. Continued compliance will be determined with subsequent inspections and reports.

2. Subpart IIII "Stationary Compression Ignition Internal Combustion Engines"

This rule applies to stationary compression ignition engines constructed or reconstructed after April 1, 2006. Only the emergency generator ES-EGEN-BS was constructed after this date. Each other engine was built before that date and is not subject to this rule.

For the purposes of this rule, ES-EGEN-BS is considered an emergency engine and certified. In general, the requirements for such engines are:

- a. Operate per the manufacturer's specifications;
- b. Operate only for emergency use or maintenance;
- c. Use low-sulfur fuel; and
- d. Install a non-resettable hour meter.

In order to demonstrate compliance with this rule, Duke-Rockingham must keep records of the generator's operation and maintenance. Records must be reported twice per year.

Based on the most recent inspection, Duke-Rockingham appears to be in compliance with this rule. Continued compliance will be determined with subsequent inspections and reports.

e. 02D .0530 "Prevention of Significant Deterioration" ("PSD"; 40 CFR Parts 51 and 70)

This rule incorporates the requirements of PSD into North Carolina's SIP.

As a result of a previous PSD review, the existing permit includes Best Available Control Technology ("BACT") limits for all sources at the facility except the generator ES-EGEN-BS. The BACT limits cover NOx, SO₂, CO, VOC, PM, and sulfuric acid. The permit includes short-term emission standards and long-term emission limits for each pollutant and subject emission source (as applicable).

Duke-Rockingham's compliance requirements are based on each subject emission source. The following table contains the general compliance requirements for each source.

Emission Source	Requirements	Demonstrate compliance by	Notes
All turbines	 BACT limits apply at all times except: 1) low load during startup/shutdown; 2) turbine tuning; and 3) limited periods of low ambient temperatures. Maximum of 3,000 hours of full-load operation, with 1,000 hours of full-load operation on fuel oil per year. Only fire natural gas during April through October, excepting gas curtailment. Fuel oil sulfur content < 0.025% 	 Keep records of operation; CEMS output, and fuel oil sulfur content. Operate a NOx CEMS as required by NSPS Subpart GG Operate a CO CEMS Report a summary of recordkeeping twice per year. 	Included in Title V permit as of the T04 revision, issued December 18, 2002. ² T12 revision (issued January 23, 2013) raised NOx limit during tuning events. T15 revision (issued March 18, 2016) raised NOx limit during low ambient temperatures
Fuel oil storage tanks	Limit total fuel oil storage volumeLimit annual fuel oil throughput	 Keep records of oil tank design capacity and fuel oil throughput Report a summary of fuel oil throughput twice per year. 	Included in Title V permit as of the T04 revision.
Emergency generator	• Operate less than 500 hours per year.	Keep records of operation, and report twice per year.	
Emergency fire pump	• Operate less than 500 hours per year.	Keep records of operation, and report twice per year.	

Based on the most recent inspection, Duke-Rockingham appears to be in compliance with this rule. Continued compliance will be determined with subsequent inspections and reports.

Note that Duke-Rockingham has submitted an application for major modification regarding the turbines (application .19A, received March 26, 2019). Duke-Rockingham's compliance requirements with respect to BACT and PSD may change as a result of this application.

f. 02D .1111 "Maximum Achievable Control Technology" ("MACT"; 40 CFR Part 63)

This rule incorporates the MACT rules into North Carolina's SIP. For the purposes of MACT applicability, this facility is considered an "area source" of hazardous air pollutants ("HAPs"). By default, rules that apply only to major sources of HAPs do not apply to this facility. Rules under 40 CFR Part 63 that apply to area sources are referred to as "GACT".

² This is the earliest Title V permit issued to Duke-Rockingham included in DAQ's electronic records.

Ultimately, the only GACT rule that applies to this facility is Subpart ZZZZ "Stationary Reciprocating Internal Combustion Engines".

Subpart ZZZZ applies to all stationary reciprocating internal combustion engines ("RICE"). The requirements of the rule are based on the individual engines.

For the purposes of this rule, ES-EGEN-BS is considered a RICE subject 40 CFR Part 60 (see Section 6.d.2 above). Such engines are only required to comply with the applicable NSPS and have no additional requirements under this rule.

For the purposes of this rule, each other generator at this facility is considered "existing" and "emergency-use". In general, the requirements for such engines are:

- a. Minimize startup, shutdown, and idling time;
- b. Regular oil and filter changes;
- c. Good work practices;
- d. Operate only for emergencies, maintenance, or as allowed by §63.6640(f);
- e. Install a non-resettable hour meter;
- f. Keep records of maintenance and operation; and
- g. Submit reports twice per year.

Based on the most recent inspection, Duke-Rockingham appears to be in compliance with this rule. Continued compliance will be determined with subsequent inspections and reports.

g. 02D .1806 "Control and Prohibition of Odorous Emissions" (State-enforceable only)

This rule requires that facilities not contribute to substantive odor complaints outside of the facility's property. This rule does not have any specific requirements for demonstrating compliance; compliance is evaluated based on complaints received (if any) and during on-site inspections.

Based on the most recent inspection, Duke-Rockingham appears to be in compliance with this rule. Continued compliance will be determined with subsequent inspections.

Note that 02D .1806 is not part of North Carolina's SIP. Therefore, this rule is state-enforceable only.

h. 02Q .0317 "Avoidance Conditions"

This rule allows facilities to accept enforceable limits to avoid applicability of rules in 15A NCAC Chapter 02D or Title 40 of the Code of Federal Regulations.

In order to avoid applicability of 02D .1100 "Control of Toxic Air Pollutants", Duke-Rockingham agreed to operate the emergency generator ES-EGEN-BS only when at least one of the five combustion turbines are not operating. This requirement was added to the Title V permit with the T11 revision (issued October 1, 2010).

In order to demonstrate compliance, Duke-Rockingham must keep records of operations at the facility and report them twice per year.

Note that 02D .1100 is not part of North Carolina's SIP. Therefore, this avoidance condition is state-enforceable only.

i. 02Q .0400 "Acid Rain Procedures"

This rule incorporates the acid rain program (40 CFR Part 72) into North Carolina's SIP.

The specific requirements for acid rain program are included in the Phase II permit application submitted by Duke-Rockingham. The Phase II permit application is included in the Title V permit as an attachment.

In general, compliance with the acid rain program is determined by USEPA, not DAQ. Continued compliance will be determined by US EPA.

j. 02Q .0512 "Permit Shield and Application Shield"

Paragraph 02Q .0512(a)(1)(B) allows Title V permits to specifically identify rules that are not applicable to the facility (referred to as a "permit shield"). The existing permit includes a permit shield for 15A NCAC 02D .2400 and the federal Clean Air Interstate Rules.

The requirements of 02D .2400 have expired, and the rule no longer contains any text at all. No permit shield is necessary for this rule, so references to this rule will be removed from the Title V permit.

There are no compliance requirements associated with a permit shield.

k. Cross State Air Pollution Rule ("CSAPR"; 40 CFR Part 97, Subparts AAAAA, BBBBB, and CCCCC; Federally-enforceable only)

This group of rules applies to fossil-fuel-fired combustion sources that are serve a generator with a capacity of 25 megawatts or more. Each combustion turbine at this facility is subject to CSAPR.

CSAPR limits NOx and SO₂ emissions. Compliance with CSAPR is determined by USEPA, not DAQ. The Title V permit contains a reference to CSAPR, but no specific compliance requirements.

1. Nonapplicable Rules:

There are several SIP and Federal rules that could potentially apply at this renewal, but ultimately do not.

1. 40 CFR Part 60, Subpart KKKK "Stationary Combustion Turbines"

This rule applies to turbines constructed, reconstructed, or modified after February 18, 2005. Each of the turbines at this facility were constructed before this date, and none of them have undergone modification or reconstruction as defined in 40 CFR Part 60. Therefore, this rule does not apply to this facility.

2. 02D .0900 "Volatile Organic Compounds" and 02D .1400 "Nitrogen Oxides" (a.k.a. "RACT")

Per 02D .0902(f) and 02D .1402(c) and (d), the RACT rules generally apply to locations designated as nonattainment for ozone. Rockingham County is not such an area, and therefore no RACT rules apply.

3. 02D .0614 "Compliance Assurance Monitoring" ("CAM"; 40 CFR Part 64)

This rule applies to emission sources that use control devices to comply with emission limits. No sources at this facility are equipped with control devices and therefore this rule does not apply.

4. 02D .2100 "Risk Management Program" (a.k.a. "Section 112(r) of the Clean Air Act")

This facility does not appear to store any materials above their respective thresholds in 40 CFR 68.130. Therefore, this facility is not required to submit a Risk Management Plan and has no specific requirements under 02D .2100.

7. Emissions Review

This permit renewal is not expected to affect potential emissions from this facility.

For a historical review of actual emissions from this facility, see the first page of this review.

8. Other Regulatory Concerns

- This facility was most recently inspected by Robert Barker on December 4, 2019. Duke-Rockingham appeared to be in compliance with the existing permit at the time of that inspection.
- There have not been any Notices of Violation issued to this facility since the previous Title V permit renewal.
- No application fee, zoning consistency determination, or Professional Engineer's seal is required for Title V and Title IV permit renewals.

9. Public Notice and EPA Review

A notice of the DRAFT Title V Permit shall be made pursuant to 15A NCAC 02Q .0521. The notice will provide for a 30-day comment period, with an opportunity for a public hearing. Consistent with 15A NCAC 02Q .0525, the EPA will have a concurrent 45-day review period. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA. Pursuant to 15A NCAC 02Q .0522, a copy of each permit application, each proposed permit and each final permit shall be provided to EPA. Also, pursuant to 02Q .0522, a notice of the DRAFT Title V Permit shall be provided to each affected State at or before the time notice is provided to the public under 02Q .0521 above. Virginia is an affected State, and Forsyth County is an affected local program located within 50 miles of this facility.

The Public Notice and EPA Review periods began on XXX

10. Recommendations

Issue permit 08731T16.

Attachment 1 to Review of Applications 7900156.20A and 20B Duke Energy Carolinas, LLC-Rockingham Co Comb. Turb.

Summary of Comments on Initial Draft of Permit 08731T16

- Mark Cuilla, hand delivered on March 23, 2020:
 - 1. The letter indicated typos in the draft permit and review.

Response: The indicated issues have been corrected.

2. Why is the monitoring language in Section 2.1 A.1.c not the same as DAQ's standard language?

Response: This 1,100 hours language is common amongst other Duke permits and I don't see the need to make any changes to it at this time.

3. Does the Title V permit need to include the entire fuel monitoring schedule in Section 2.1 A.2.c.i?

Response: This is part of an alternate monitoring plan previously approved by DAQ. I don't think it should be modified at this time, even to remove potentially repetitive language.

4. Should the Title V permit include monitoring for the annual SO₂ emission limit in Section 2.1 A.3?

Response: The monitoring for PSD included in the permit was originally implemented in the T04 revision. I don't think it should be modified at this time outside of another major modification.

5. Should the Sections 2.1 C.3.b and 2.1 D.3.b include a noncompliance statement?

Response: Yes, I have now added this to the permit.

- Erin Wallace, by email on April 3, 2020:
 - 1. The mailing address for this facility should be the same as Duke's Dan River facility in Eden, NC:

864 South Edgewood Road Eden, NC 27288

Response: I confirmed that this is the correct mailing address.

2. The email indicated typos in the draft permit and review.

Response: The indicated issues have been corrected.

3. 40 CFR Part 63 Subpart ZZZZ is still considered a MACT, to which both Major and Area Sources can be subject.

Response: It is DAQ's policy to refer to Subpart ZZZZ as "GACT" in emission source tables when the facility is an area source. In this case, the tag "(MACT)" or "(GACT)" is only a reminder and does not have regulatory significance.